ISO 20339:2017-03 (E)

Non-destructive testing - Equipment for eddy current examination - Array probe characteristics and verification

Contents

Page

Foreword v

1 Scope 1

2 Normative references 1

3 Terms and definitions 1

4 Probe and interconnecting elements characteristics 2
4.1 General characteristics 2
4.1.1 Application 2
4.1.2 Probe types 2
4.1.3 Interconnecting elements 2
4.1.4 Physical characteristics 2
4.1.5 Safety 3
4.1.6 Environmental conditions 3
4.2 Electrical characteristics 3
4.3 Functional characteristics 3

5 Verification 4
5.1 Level of verifications 4
5.2 Characteristics to be verified 4

6 Measurement of electrical and functional characteristics of an array probe 5
6.1 Electrical characteristics 5
6.1.1 General 5
6.1.2 Measurement conditions 5
6.1.3 Impedance of coil elements 5
6.1.4 Impedance of a pattern 5
6.1.5 Channel assignment -- Sequencing 6
6.1.6 Cross-talk 6
6.2 Functional characteristics 6
6.2.1 General 6
6.2.2 Measurement conditions 6

7 Surface array probes 8
7.1 Reference blocks 8
7.2 Probe motion 9
7.3 Reference signal -- Normalization 9
7.4 Edge effect (measurable in the case of simple geometry, e.g. metal sheets, disks) 10
7.5 Response to a slot 11
7.6 Response to a hole 12
7.7 Length of coverage 12
7.8 Variation in sensitivity between patterns 12
7.9 Minimum slot length for constant probe response 13
7.10 Lift-off effect 13
7.11 Effect of probe clearance on slot response 13
7.12 Effective depth of detection of a sub-surface slot 14
7.13 Resolution 14
7.14 Defective element or pattern 14

8 Coaxial array probes 14
8.1 General conditions 14
8.2 Reference blocks 14
8.3 Reference signal 16
8.4 Absence of defective elements 17
8.5 Position mark of the probe (mainly for positioning) 17
8.6 End effect 17
8.7 Length of coverage 17
8.8 Homogeneity of axial response 18
8.9 Eccentricity effect 19
8.10 Fill effect 19
8.11 Effective depth of penetration 19
8.12 Effective depth of detection under ligament 19

9 Influence of interconnecting elements 19

Annex A (informative) Simulation of surface probe resolution 20